

## **Response To Panos Prevedouros’ “20 Reasons For Choosing Bus Technology”**

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1. ***Claim:*** *“From a capacity analysis standpoint, rubber tire technology even with plain buses is comparable and in many aspects superior to steel-wheel on steel-rails technology...”*

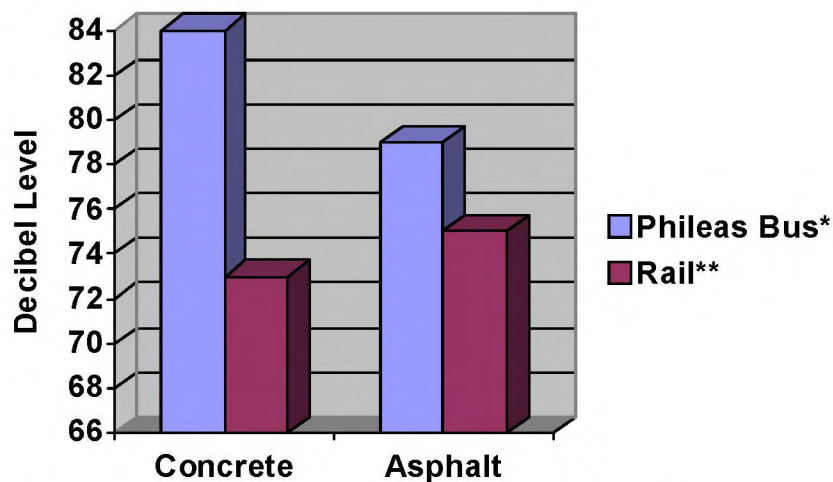
**Response:** This statement is simply incorrect. One does not need to be a mathematician to recognize that far more “plain buses” are necessary to carry a given number of passengers than the number of trains required to carry the same passenger load. Even if the above claim was correct, Professor Prevedouros misses the point. Honolulu’s traffic congestion is among the worst in the United States, and projections indicate that it will worsen in coming years. Both rubber tire technology (buses) and rail technology working in a complementary system are needed to address Honolulu’s traffic problems. Virtually every city in the U.S. with a population over 750,000 people has both buses and some form of rail technology in operation, construction, or in the advanced planning stage.

After reviewing the information provided by various vehicle suppliers for both rubber tire and rail-based technologies, a panel of transit experts independently came to the conclusion that modern rail technology is the best choice for the Honolulu High-Capacity Transit Corridor Project. Only Professor Prevedouros, who also sat on the panel, disagreed. The facts are simply indisputable that rail has the best long term operating performance characteristics, including higher passenger carrying capacity, better ride quality, lower noise impacts, better energy efficiency, positive air quality impacts, and lower long term “life-cycle” operating costs.

2. ***Claim:*** *“Review of the technical specifications in side-by-side comparisons reveal rubber tire systems have a number of advantages...”*

**Response:** Prevedouros has recommended a new technology, the Phileas Bus, as the rubber tire rapid transit system to compare to rail technologies. It is important to point out that the Phileas Bus has never been built as a rapid transit system. A close look at the claimed advantages of the Phileas bus has shown these advantages do not exist. There is no difference in acceleration, deceleration, accident avoidance or ADA Compliance. Additional research, including a call directly with the Phileas Manager of Marketing and Sales by the City’s Rapid Transit Division, found:

- The Phileas Bus does not run in fully automatic operation at 55 MPH. There is no safety certification in Europe for this system to run in automatic operation, although the manufacturer has applied for a 37 MPH certification. This system cannot run automatically at the speeds required for the Honolulu project. If operators are added to the system to meet the required top speed requirements, the claimed operating costs will increase significantly.
- In order to carry the same number of people, there is no significant difference between the cost and size of an elevated structure necessary to carry buses or rail technology. In fact, at stations and other locations, the size and profile of a structure for buses is likely to be more obtrusive than one for light rail. The maximum weight load for the Phileas vehicle is 192,000 lbs. in each guideway span compared to approximately 230,000 lbs. for rail technology. The difference in cost to construct either a busway structure or a light rail structure is less than 5%.
- Despite claims to the contrary made by Professor Prevedouros, the rail technologies being considered for the project are actually quieter than the Phileas Bus. Based on information provided by Phileas, its vehicles operating at 50 miles per hour produce noise levels along the guideway at 79 dbA on asphalt and higher on concrete. Actual noise levels for two rail systems being considered for the project at 55 miles per hour are 75 dbA and 73 dbA.



\* At 50 mph (this speed not possible in Phileas' current automated configuration).

\*\* At 55 mph.

- The Phileas Bus System will cost significantly more than a rail system to operate. The primary factor in determining the operating costs of a transit system is labor cost. According to information obtained directly from Phileas, each vehicle with one driver can carry as many as 212 passengers, with 20% seated. A three-car light rail train with one driver can carry 954 passengers with 30% seated. In other words, the Phileas system may require as many as

4-5 times as many drivers during peak periods in order to carry the same number of passengers as a rail system.

3. **Claim:** *“The City planning and engineering design consultant for this project, Parsons Brinckerhoff, Inc. provided a spreadsheet with 21 criteria to evaluate technologies. Panel members were able to add criteria and use their independent evaluation method...”*

**Response:** The decision at the panel’s inaugural meeting was that panel members could use any evaluation method they chose and could also add additional evaluation criteria to choose one of the four technologies the City Council had approved in support of the adopted project alternatives. Three additional criteria were discussed and agreed upon by the panelists. Managed lanes/HOT lanes or Personal Rapid Transit were not alternatives to evaluate.

All other panelists followed the process, utilized the extensive criteria provided by the consultant, and found that rail technology was the most advantageous technology for this project. Professor Prevedouros chose to evaluate a totally different set of technologies without the benefit of discussion from other panelists or City staff. His analysis represents an interesting academic rating exercise, but actual decisions are being made for transportation investment, not for a classroom grade. By any objective standard of practice, “managed lanes” cannot form the backbone of a public transit system with the current and projected transit ridership of Honolulu. While managed lanes can, and do, serve as a tactical option for adding limited capacity to existing freeways and highways, a managed lane system is simply not comparable to a fixed guideway system. It provides no incentives for people to reduce or eliminate automobile use and gives significant advantages only to those few who choose to pay often exorbitant rates for the privilege of having free-flow conditions for a portion of their commute. Parking still needs to be provided at destinations, and managed lanes do nothing to reduce local street and arterial route congestion once the toll-payers leave the toll lane.

The comparison of a modern urban rail transit system to a managed lane is somewhat like comparing a single 747 jumbo jet to 150 privately owned, single-engine propeller planes as alternative means of moving people effectively and efficiently through airspace

An excellent review of the concept of managed lanes can be found in the *Star Bulletin* Editorial section on March 3, 2008 and is attached.

4. **Claim:** *“Based on U.S. experience, a proposed light rail system for Honolulu will produce too little benefit to justify the high cost...”*

**Response:** How much “benefit” is provided by parks, libraries, public schools, police and fire protection services, street repair, and other public services that form the fabric of a community? To think of public transport as a capital investment seeking a financial return may again be an interesting academic exercise, but the actual, long-term community benefits of governmental investment in public works are measured in a variety of ways in addition to simply financial return on invested capital. If an economist or academician were to measure the “value” or “benefit” of Kapiolani Park based solely on the number of park visitors as a percentage of Hawaii’s total population, one might conclude that the Park ought to be demolished and government should instead build structures for paid parking as a better and more economic use of public funds.

The concept of cost-benefit analysis for federal transit investment was put in place primarily to prioritize the huge number of cities and regions throughout the United States seeking federal dollars to support their respective community transit investments. In recent years, however, the federal government – rightly or wrongly – has defined mass transit capital investment increasingly as a local option investment, and has thus looked to the cities and states to find revenue sources to supplement federal aid. Honolulu, with the wisdom to put in place a local excise tax increase targeted for transit, is considered an excellent example of this approach.

Moreover, when one reviews the “benefit” of a transit investment using the complex federal formula, Honolulu is near the top – that means it is one of the most cost-effective transit investments of any evaluated by the professional staff of the Federal Transit Administration. And that is why, of course, Honolulu is likely to receive around \$1 billion in federal capital grants. If the Honolulu fixed rail transit proposal had little benefit, as Dr. Prevedouros suggests, it would certainly not rate near the top of the list of some 50 cities waiting in line to receive federal capital assistance for rail transit extensions and new starts.

The benefits of building a rail system in Honolulu are extensive and go well beyond the large daily ridership of the system. As fuel costs approach \$4.00 per gallon and traffic continues to worsen between the Ewa/Kapolei area and downtown, residents and visitors are increasingly likely to demand choices in how they travel. Even if one never uses the rail system, there will be community-wide benefits from the thousands of jobs created during construction and during the operation of the system. In addition, new development will be planned and built adjacent to stations that will promote economic development and provide new jobs at a time of economic uncertainty in Hawaii. Of course, benefits to the environment will be tangible as people choose to use rail transit instead of their cars during rush hours. All of these benefits have occurred in cities that have built rail transit, both in the U.S. and around the world.

In his paper, the professor has questioned the ridership forecasts for the system. First, there is no such thing as “the average” LRT in the U.S. Each system is

uniquely planned for its users following stringent federal guidelines and a process that must be followed if federal funds are going to be used. In accordance with ridership projections, which were made following very conservative federal guidelines, 95,000 trips a day will be made on the system, not the 15,308 projected by the professor. In fact, every rail system in the U.S. with the characteristics of Honolulu's system has far exceeded the professor's ridership numbers.

5. **Claim:** *"Honolulu is simply too small for any light or heavy rail system..."*

**Response:** The density of population – that is, how people live and work – is a much more important determinant of transit ridership than simply the number of people living in city or community. Eight years ago, the 2000 census showed Honolulu's urbanized area ranked sixth in population density among cities in the U.S. with a population of 500,000 or more. Rail succeeds in high density corridors, especially where there are few transportation options. Congestion is overwhelming in Honolulu because we essentially have only one high density corridor between the mountain and the sea, which is precisely the reason that fixed guideway rail transit is considered by the Federal Transit Administration and independent experts to be so beneficial in Honolulu.

6. **Claim:** *"People often refer to large rail systems in world capitals..."*

**Response:** Every major city in the world, whether a "capital city" or not, has some form of rail system. The size of the rail system planned for Honolulu is appropriate for the community's size and the level and duration of congestion within the primary corridor. Numerous cities with populations under a million have effective and efficient transit systems, primarily in Europe, where gasoline now costs about \$1.50-\$2.00 per liter, or \$6-\$8 per gallon. The United States has by far the cheapest and most plentiful fuel anywhere in the world. How long will that last? Should we bet our future on imported oil?

7. **Claim:** *"In general, US rail ridership numbers are dismal for new system..."*

**Response:** "Dismal" is an interesting but non-measurable concept for transit ridership. Presumably, some might consider rail transit ridership in Salt Lake City or San Francisco, or even New York or Chicago to be "dismal." The reality, of course, is that this statement is simply not true. If ridership is so dismal, why have the citizens of virtually every US community where there has been a significant investment in building a rail system passed measure after measure at the ballot box authorizing increased – and in many cases, greater – taxes to extend the system?. The vast majority of rail systems opened in the past 10 years in the U.S.

have far exceeded their projected ridership forecast, as is expected to happen in Honolulu. These include:

- Dallas
- Houston
- Denver
- Sacramento
- San Diego
- Portland
- Minneapolis
- Salt Lake City
- Los Angeles
- Charlotte

These systems, and many others, have been a great success, if one measures “success” in terms strong community support and the fact that every one of these systems is being expanded through public support at the ballot box.

8. **Claim:** *“Hawaii has the second lowest drive-alone rate in the country and the highest car pooling rate ...”*

**Response:** This observation is actually quite supportive of the desirability of a mass transit system in Honolulu, as it demonstrates that people in Hawaii are concerned over congestion and want choices. It is important to note that the state with the lowest drive-alone rate in the country – New York – also has the highest rail ridership in the country.

9. **Claim:** *“From a Federal Policy standpoint, BRT makes most sense for public transit financing...”*

**Response:** The source of Prevedouros’ quote, *Innovations Briefs*, is a small-circulation, private anti-transit newsletter which has a long history of opposing investment in any type of rail transportation system. In reality, over the last eight years the Federal Transit Administration has invested over 80% of the nation’s New Starts funding, for which BRT systems are eligible, in new rail systems.

10. **Claim:** *“Hawaii rated last in the cost of car ownership for the last five years...”*

**Response:** This is Professor Prevedouros’ most compelling argument in support of a fixed rail transit investment in Honolulu. The cost of owning and operating a car in Hawaii is higher than anywhere else in the United States. Communities that are almost totally dependent on road technologies experience the highest cost of auto ownership. The people of Honolulu deserve to have more choices. As the cost of gasoline approaches \$4.00 per gallon, this situation will only get worse. Is



there any more compelling argument in favor of moving ahead expediently with the rail-based system now selected for Honolulu's primary corridor?

*11. Claim: "Rail is a 19<sup>th</sup> Century polluting technology..."*

**Response:** It is a myth that rail is a 19<sup>th</sup> century technology. Today's urban passenger rail systems are as different from 19th century railroad technology as the Toyota Prius is from a Ford "Model T" automobile. The Phileas Bus fleet cited by Professor Prevedouros would add a large number of buses to already overcrowded roadways, contributing significantly to pollution – both air and noise. Technology appears to be moving toward more efficient vehicles with less intensive greenhouse gas emissions for all vehicles and by 2030, rail, bus, and, hopefully, the automobile will be virtually non-polluting.

*12. Claim: "The failure of Sound Transit in Seattle is a luminous prediction of rail for Oahu..."*

**Response:** Sound Transit in Seattle is not a failure. In fact, we fail to understand how the Professor can call this transit system a failure, when it isn't scheduled to open until 2009. Indeed, the Federal Transit Administration has provided significant funding to support the construction of this highly cost-effective investment. Perhaps Prevedouros, once again, is confused. The "15 billion failure" that he cites is not "Sound Transit," but we suspect he is probably mistakenly referring to the ballot measure that failed in November 2006 in the Puget Sound region. This was a multi-modal spending initiative, and much of the \$15 billion investment was for roadway, freeway and bridge repair and improvement in addition to rail and bus systems. The consensus on the bill's failure to pass was that it was simply too far-reaching, with too many projects, over too many years, with insufficient accountability among the various agencies responsible for the various transport investments.

Prevedouros quotes from a Seattle Times editorial concerning the Portland light rail system and somehow infers that people in Portland are unhappy with their public rail investment. Ridership on the Portland light rail system has far exceeded projections and the system has been expanded five times, including a new line scheduled to open in 2009. In the past 10 years, the only measure that has not passed to expand the system was to extend the line north across the Columbia River into the State of Washington.

*13. Claim: "Expressways with buses and vanpools are simple, but rail is complex with literally millions of wearing and weathering components..."*

**Response:** In Point 11, Prevedouros cited rail as an archaic, 19<sup>th</sup> century technology. Here he cites its technological complexity. Yes, a modern urban rail transit system is a complex electro-mechanical system, with numerous subsystems that have evolved over time. These complex systems and subsystems actually provide benefits to the operation of the rail line by doing such chores as reducing acceleration noise to a whisper, minimizing vibration, providing air conditioning, reducing power consumption by storing kinetic energy through regenerative braking, and providing communications and continuous interaction with passengers on the train and in the stations. All transportation infrastructure requires routine maintenance and replacement. As for the BART system, mentioned by the professor, the costs cited are for the refurbishment of the 102-mile-long system with 43 stations. The BART system has been operating for over 35 years with its 439 original vehicles. To better balance the perspective, the cost to refurbish and rebuild H1, H2, and H3 over the next 25 years would be similar to that of the BART program.

14. **Claim:** *“Transit Oriented Development (TOD) are generally Taxes Offered to Developers for packing people into less land and elevated rail technology is “in fact” inferior for TODs...”*

**Response:** This is a very cute play on the “TOD” acronym, but it is, of course, factually inaccurate. Transit Oriented Development is the result of good land use planning and the coordination of transportation investments with development. The facts show that rail transit, regardless of whether it is elevated, at street level, or underground, can be a powerful tool to generate economic development. For example, in the most recently opened rail system in Charlotte N.C., economic development along the 10-mile line has created \$1.8 billion in new housing, retail, and commercial development. The entire South Corridor line cost approximately \$420 million, with most of the rail stations elevated, and has been a great investment for the community. New taxes generated to the city of Charlotte from this development means less taxes on residents and businesses in the community.

The Charlotte TOD experience is not unusual and is common throughout the U.S. where rail development has taken place. There is no parallel experience for buses in the US. The main reason for this is that, like freeways, which also generate significant economic development, rail transit is more attractive to the private sector than buses because it is a permanent piece of infrastructure which is typically immovable. If the private sector is going to invest tens of millions of dollars in the community, developers need to know the political process will not result in moving the transportation system away from their development. It is too easy to cut back bus service, change routes, etc. when budgets get tight, and the private sector does not react well to uncertainty.



*15. Claim: “Honolulu is not likely to charge fares similar to other rail systems and therefore at best can only afford improved buses...”*

**Response:** Fare policy is set by local officials and train fares are often in line with express bus fares in other systems. The fare policy for the Honolulu rail system has not yet been established. The \$150 million per annum in O&M costs mentioned in the professor’s paper is unsubstantiated. However it is overwhelmingly clear that a rail system will be substantially less expensive to operate and maintain than a bus system designed to carry the same number of people in the peak periods.

*16. Claim: “A new fixed guideway system that does not provide competitive travel times will not attract Oahu commuters...”*

**Response:** The Alternative Analysis for the project requires that the proposed transit system serve the entire corridor, not just the end points. The bus/HOT system proposed by the professor does not meet that criteria and could not carry the same number of trips projected for the rail system. Rush hour travel times for the entire 30-mile system will be very competitive with automobiles travel. Once the system is complete, it will take 60 minutes from end to end, not 75 minutes as stated by the professor. Of course, the vast majority of riders will not be riding the system from end to end and therefore will experience much shorter travel times than the 60-minute end-to-end time.

Prevedouros and other anti-rail crusaders continue to state that “...rail transit will make congestion worse in the future...” As an academician, the professor should know that correlation and causation are different measures used to associate the behavior of one variable as a function of another. Traffic congestion will worsen between now and 2030 as a function of increased population, greater mobility, and increased trip-making. The statistic that these critics should cite is the level of congestion projected in 2030 *with and without* fixed rail transit, recognizing clearly that automobile congestion would be much worse, particularly in peak periods, without investment in fixed guideway rail transit.

*17. Claim: “Hawaii is susceptible to weather and natural disasters...”*

**Response:** Rail systems have been built in numerous communities that, like Hawaii, have weather and natural disaster concerns including:

- San Francisco
- Los Angeles
- Miami
- Houston
- Denver
- San Diego

- Sacramento
- Salt Lake City

Following the 1995 earthquake in the San Francisco Bay Area, the Bay Bridge was shut down for months due to a collapsed section and at least two other major freeway segments collapsed, severely disrupting road traffic in and out of San Francisco. BART, with its extensive, undamaged, elevated and tunnel segments, was back in operation almost immediately, following a safety inspection, and provided an essential link in the Bay Area for both emergency services and the general public. In a natural disaster, all transportation systems will be important and having a rail system will be an important new component to Honolulu's emergency services capability.

With respect to Prevedouros' comment about tour buses, many of the most successful tour services around the world provide rail transfers and make use of a region's intercity and urban rail system. Think how pleasant Honolulu, Waikiki, and other locales would be if the number of obtrusive tour buses was reduced, even slightly, from today's levels. People from Japan, Europe, and many parts of Asia will feel quite comfortable and secure using rail transportation, because their communities have more than likely already made substantial investments in rail transport systems.

**18. Claim:** *"Markets, people and manufacturers adapt to new technologies and emerging challenges such as fossil fuel depletion and global warming. Rail is a 19th century technology and will function like a 1980's metro rail system..."*

**Response:** As we get toward the number 20, we seem to be repeating ourselves. Although this claim has been previously addressed, it is important to point out that there is more development of modern rail systems in the U.S. and the world happening right now than ever in history. In addition, just about every city in the U.S. that has built a rail system in the past 15 years is expanding it. The rest of the world simply believes the professor is wrong, and that promoting a transportation policy that relies primarily on roadway technologies is out of step with the market, the environment, and the future quality of life for people who choose to live in urban areas like Honolulu. (Furthermore, – as Prevedouros points out – given that substantial improvements to rail technology were made 30 years ago, it is somewhat inappropriate to refer to rail technology as being "19<sup>th</sup> century.")

**19. Claim:** *"Traditional advocates for rail who also were strong advocates for rail in the 2006 public testimonies in Honolulu include Planners, Architects, and College students have had a "change of heart" ..."*

**Response:** To date there is no evidence that planners and architects have had a change of heart concerning their support of rail. There is a reasonable debate

going on among some in the community over the merits of at-grade rail systems as compared to elevated systems. At-grade rail operation has been previously studied and rejected because, among other reasons, it is slower, has substantial negative impacts on street traffic and pedestrians, and can not carry the number of trips needed in Honolulu.

As for the students at the University of Hawaii, the resolution was prompted by an intensive lobbying effort by the Green Party assisted by persuasive sales representatives from Phileas Bus. We won't speculate here whether any of the faculty were involved. However, the widely distributed "fact sheets" accompanying this campaign are rife with inaccuracies and heavily-biased comparisons including such misleading statements as calling the Phileas system "Magnet Rail," when there is no rail involved, and that it is, "a train that looks like a super bus," when it is actually an articulated bus trying to look like a rail vehicle.

Support for rail remains strong in Honolulu with the general public, as expressed in hundreds of meetings during the planning process. In addition, there is strong support by many community leaders and many in the media who have looked at this issue in a very objective way.

**20. Claim:** *"Managed lanes/HOT lanes should be the preferred alternative compared to traditional limited definitions of fixed guideways..."*

**Response:** The professor quoted John F. Kennedy to support the above assertion. President Kennedy said, "It is not the wealth of a nation that builds roads, but the roads that build the wealth of a nation." Of course, in the 1960's building roads was essential to our nation's prosperity. Today, investing in transportation is no less important and as we have seen throughout the U.S., investing in rail transit is an important element in the building of our nation's wealth. Providing a safe, fast, clean, rail alternative for the people of Honolulu is critical to the community's betterment. We have sufficiently discussed the reasons that a managed lane approach cannot substitute for a fixed rail investment as the backbone of a regional transit system.

We conclude our response by noting that President Kennedy also memorably embraced technology and innovation. Much of today's automated transport technology evolved from JFK's equally famous pledge to "put a man on the moon" and, in so doing, create entirely new technologies that would find their place in the betterment of society. Ironically, we have heard it said many times: "If we can put a man on the moon, why can't we build a modern urban transportation system?"